Active Dwarf Galaxies as Circumnuclear Regions of LSB-galaxies

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Abstract

Some arguments are brought, that often active dwarf galaxies are the circumnuclear regions of LSB galaxies in fact, rather than the ordinary galaxies.

1 Introduction.

The important role of LSB (Low Surface Brightness) galaxies for extragalactic researches came during the last two decades. They are usually defined as galaxies with a blue central surface brightness fainter than $21^m.65$ [1]. However there are the number definitions of LSB galaxies along their central and average surface brightness.
A great number of LSB galaxies were found on the plates of the new Palomar Observatory Sky Survey - POSS2. What is more often the normal galaxies turned out to be as LSB ones after discovery of LSB large halos, spiral structure and other details on the deeper images.

2 Hypothesis and observable facts.

Suppose, that active dwarf galaxies with diameters no more than 5 kpc really are not the normal formed galaxies. Probably they are the central parts, may be buldges, of normal or even giant LSB galaxies. Suppose, that the dimension of an average normal galaxy is about 20 kpc. In this case we can see the next basic forms of flat active galaxies.
First. Active region, having the size no more than 5 kpc, has the weak halo up to 20 kpc in diameter. All morphological types of flat systems with different types of activity, as Sey-type, starbursts, BCGs and others may be constructed, changing the surface brightness of this halo from values, which have not been seen in optical light $\mu_0 > 26^m/arcsec$, when we can see only "naked" active region, to the level of high surface brightness.
Second. It is the case, when some number of weak stellar associations there are in the unseen halo.
Third. The third case, when we can see only active nuclear part and one great superassociation in the unseen LSB-halo.
If the halo and/or stellar associations are very weak and they can't be seen on our plates even with our largest optical telescopes because for $\mu_0 \gg 26^m/arcsec$, then we can see only buldge, circumnuclear part of really LSB-galaxy. Then we get all types of active dwarf "galaxies".
So we propose the next tasks:

- The searching for weak halos or weak spiral structure around active dwarf galaxies.
- The searching for weak blue stellar or semistellar objects, probably stellar associations and superassociations near active dwarf galaxies.

Well, the examples of such systems had already been discovered.

• There are many active dwarf galaxies with huge unseen halo. Only after obtaining deep images many active dwarf galaxies show this halos. Therefore these active dwarf galaxies turned out to be normal galaxies according to their dimensions. Such galaxy often has very low mean surface brightness. There are Markarian galaxies among them, Arakelian galaxies, which, by the way, were discovered by their high surface brightness, KUG-Kiso ultraviolet galaxies from Kiso survey, active galaxies from University of Michigan (UM-galaxies) [2]), Wasilewsky galaxies [3].
In all these cases the galaxy changes its morphological type and active region turn out to be either central part of galaxy or its SA-superassociation.
Let us consider the blue dwarf galaxies from the list [4] or [5]. They are weak and often haven't any spectral data. But it's not excluded, that blue or very blue very weak galaxies from these lists are active dwarf galaxies or nuclear parts of normal galaxies, but we haven't spectral or detailed images with good resolution to say about active knots or hot spots in its.
Therefore, going from normal galaxies to dwarfs we are going from full galaxy to its central part region. So it's very difficult to describe the morphology of dwarf galaxies, because they are circumnuclear regions of galaxies, probably LSB-galaxies.
Possibly, all above mentioned belongs to ordinary normal (not active galaxies) (see, for example, UGC 9024 or NGC 628).
Present examples show, that often really take place great LSB-halo with active formation in it. It isn't already the dwarf galaxy. But probably some of them are really active dwarf galaxies.
Now at last there are intensive searches for galaxies, which are the triggers of high star formation rate in BCDGs. Near some BCDGs with low metallicity, such as, for example, Mkn 116=Izw 18, SBS 0335-052, HS 0822+3542 were discovered very weak blue dwarf companions on the projected distances $< 20kpc$ (Mkn 116NW, SBS 0335-052E, SAO 0822+3545) (see [6], [7], [8]). It may be interpreted as the triggers of high star formation rate in these galaxies. But may be they are the SA in these galaxies. In this case these dwarf galaxies are not the "dwarf" ones, but the huge LSB galaxies, where they are the circumnuclear parts, and weak companions are the outer parts or stellar associations in its.

3 Conclusions.

1. Active dwarf galaxies are very similar by their structure, morphology, dimensions, luminosities to the circumnuclear regions of normal or even giant galaxies.
2. There is the number of examples, when active dwarf galaxy turned out to be active nuclear region of huge LSB-galaxy on the deeper plates.
3. On this basis we propose, that active dwarf galaxies often are "naked" nuclear region. Probably, they are the nuclear parts of LSB-galaxies, the halos of which we can't observe even with the largest ground-based telescopes.
It is evident, that LSB and HSB galaxies are the extreme stages of galaxies. Evidently there are all intermediate classes of galaxies. So, for example, the host galaxies of Markarian galaxies often have lower surface brightness and therefore their active nuclear regions have been easy discovered on the survey plates.

References

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